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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/614,032	07/08/2003	Kouichi Mochizuki	239876US2	6678
22850	7590	12/14/2005	EXAMINER	
OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			PARRIES, DRU M	
			ART UNIT	PAPER NUMBER
			2836	

DATE MAILED: 12/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/614,032

Applicant(s)

MOCHIZUKI, KOUICHI

Examiner

Dru M. Parries

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 08 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3,4,6 and 7 is/are rejected.
- 7) ☒ Claim(s) 2 and 5 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 7-8-03 & 3-14-05 & 5-31-05
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Specification***

1. The disclosure is objected to because of the following informalities: On page 18 and higher, there is mention of a "coil section 34", however, there is no reference numeral 34 on any of the Figures.

Appropriate correction is required.

2. The abstract of the disclosure is objected to because the reference numbers should be in parenthesis. Correction is required. See MPEP § 608.01(b).

### ***Drawings***

3. Figure 5 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawakami (5,621,257), Forth et al. (2004/0122833), and admitted prior art (Admission). Kawakami teaches a gate driving circuit comprising a wire that connects the emitter to an external load (wire with primary winding; Fig. 5). He also teaches an electromotive force inducing coil section (6) where one end is connected to the gate terminal of IGBT (1) and the other end is connected to the gate bias power source (2). The coil section induces a force based only on a current through the power-switching device. He also teaches a gate bias reference wire connected between the gate bias power source and the emitter terminal of the IGBT (3). Kawakami fails to teach the electromotive force inducing coil wound around a part of the wire in an electrically insulated condition. He also fails to teach a gate driving current suppressing resistor. Forth teaches the idea of a current sensor, such as a Rogowski coil, being used in place of a current transformer. It would have been obvious to one of ordinary skill in the art at the time of the invention to replace the current transformer in Kawakami's invention with a Rogowski coil taught in Forth, because it will save money and space inside the circuit. Admission teaches the use of a gate driving current suppressing resistor (Fig. 5). It would have been obvious to one of ordinary skill in the art at the time of the invention to implement a gate driving current suppressing resistor into Kawakami's invention so that the current fed to the gate terminal of the IGBT isn't too large.

6. Claims 4, 6, and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawakami (5,621,257), Forth et al. (2004/0122833), admitted prior art (Admission) and Changey et al. (6,297,097). Kawakami teaches a gate driving circuit comprising a wire that connects the emitter to an external load (wire with primary winding; Fig. 5). He also teaches an

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electromotive force inducing coil section (6) where one end is connected to the gate terminal of IGBT (1) and the other end is connected to the gate bias power source (2). The coil section induces a force based only on a current through the power-switching device. He also teaches a gate bias reference wire connected between the gate bias power source and the emitter terminal of the IGBT (3). Kawakami fails to teach the electromotive force inducing coil wound around a part of the wire in an electrically insulated condition. He also fails to teach a gate driving current suppressing resistor. He also fails to teach the entire circuit being mounted on a power switching device chip. Forth teaches the idea of a current sensor, such as a Rogowski coil, being used in place of a current transformer. It would have been obvious to one of ordinary skill in the art at the time of the invention to replace the current transformer in Kawakami's invention with a Rogowski coil taught in Forth, because it will save money and space inside the circuit.

Admission teaches the use of a gate driving current suppressing resistor (Fig. 5). It would have been obvious to one of ordinary skill in the art at the time of the invention to implement a gate driving current suppressing resistor into Kawakami's invention so that the current fed to the gate terminal of the IGBT isn't too large. Changey teaches a semiconductor device chip with emitter, collector and gate pads. It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the above circuit arrangement onto a semiconductor device chip to minimize the amount of space taken up by the circuit.

***Allowable Subject Matter***

7. Claims 2 and 5 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. These claims would be allowable because no prior art of record

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teaches a diode in parallel across a power switching device, and being connected to the emitter side between a Rogowski coil and an external load.

***Conclusion***


8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Iijima et al. (2002/0113569) who teaches a flywheel diode whose cathode is connected to the emitter and whose anode is connected to the collector of an IGBT.
9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dru M. Parries whose telephone number is (571) 272-8542. The examiner can normally be reached on Monday -Thursday from 8:00am to 5:00pm. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Sircus, can be reached on 571-272-2800 x 36. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DMP

12-6-2005



**BRIAN SIRCUS**  
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